

What is claimed is:

1. A method of measuring a similarity between texture features of a first image and a second image, the method comprising the steps of:

(a) computing a statistical dissimilarity between the first and second images;

5 (b) computing a perceptual dissimilarity between the first and second images; and

(c) computing a dissimilarity between the texture features of the first and second images based on the statistical dissimilarity and the perceptual dissimilarity.

2. The method of claim 1, wherein the step (b) comprises the steps of:

(b-1) computing regularity of the texture of the first and second images; and

5 (b-2) computing a dissimilarity between the computed regularities of texture of the first and second images.

3. The method of claim 1, wherein the step (c) comprises the steps of (c-1) determining the dissimilarity between the texture features as a value proportional to the statistical dissimilarity when the perceptual dissimilarity is smaller than a predetermined threshold.

4. The method of claim 1, wherein the step (c) comprises the steps of (c-1) determining the dissimilarity between the texture features based on an exponent of the power of the statistical dissimilarity, the exponent being the perceptual dissimilarity, when the perceptual dissimilarity is smaller than a  
5 predetermined threshold.

5. A method of measuring a similarity between texture features of images, the method comprising the steps of:

(a) computing a statistical dissimilarity  $d(i, j)$  between two images  $i$  and  $j$  using a statistical-based texture descriptor;

5 (b) obtaining quantitative measurements  $P^{(i)}$  and  $P^{(j)}$  of texture patterns of the two images  $i$  and  $j$  in terms of regularity; and

(c) obtaining a dissimilarity between the texture features by computing a dissimilarity  $\hat{d}(|P^{(i)} - P^{(j)}|)$  between the texture patterns of the two images  $i$  and  $j$  in terms of regularity, where  $\hat{d}$  is assumed to be a predetermined  
10 function whose value is determined according to a range of a magnitude of a perceptual dissimilarity.

6. The method of claim 5, wherein the step (c) comprises the step of (c-1) computing a dissimilarity  $D(i, j)$  between the texture features of the two images  $i$  and  $j$  in accordance with the equation  
$$D(i, j) = d(i, j) + d(i, j)^{\hat{d}(P^{(i)}, P^{(j)})}$$
 using statistical dissimilarity data and

5 regularity-dissimilarity data, when it is assumed that  $\alpha$  is a predetermined scaling factor, and  $\hat{d}$  is a function defined as

$$\hat{d}(P^{(i)}, P^{(j)}) = \begin{cases} 0 & |P^{(i)} - P^{(j)}| \leq 1 \\ |P^{(i)} - P^{(j)}| & |P^{(i)} - P^{(j)}| > 1. \end{cases}$$

7. A computer-readable recording medium storing a computer program for executing a method of measuring a similarity between texture features of images, the recording medium comprising:

- (a) computer readable means for computing a statistical dissimilarity  $d(i, j)$  between two images  $i$  and  $j$  using a statistical-based texture descriptor;
  - (b) computer readable means for obtaining quantitative measurements  $P^{(i)}$  and  $P^{(j)}$  of texture patterns of the two images  $i$  and  $j$  in terms of regularity; and
  - (c) computer readable means for obtaining a dissimilarity between the
- 10 texture features by computing a dissimilarity  $\hat{d}(|P^{(i)} - P^{(j)}|)$  between the texture patterns of the two images  $i$  and  $j$  in terms of regularity, where  $\hat{d}$  is assumed to be a predetermined function whose value is determined according to a range of a magnitude of a perceptual dissimilarity.

8. The computer-readable recording medium of claim 7, further comprising a computer readable means for computing a dissimilarity  $D(i, j)$  between the texture features of the two images  $i$  and  $j$  in accordance with the

equation  $D(i, j) = d(i, j) + d(i, j)^{\hat{d}(P^{(i)}, P^{(j)})}$  using statistical dissimilarity data  
 5 and regularity-dissimilarity data, when it is assumed that  $\alpha$  is a predetermined  
 scaling factor, and  $\hat{d}$  is a function defined as

$$\hat{d}(P^{(i)}, P^{(j)}) = \begin{cases} 0 & |P^{(i)} - P^{(j)}| \leq 1 \\ |P^{(i)} - P^{(j)}| & |P^{(i)} - P^{(j)}| > 1. \end{cases}$$

9. A device for measuring a similarity between texture features of  
 a first image and a second image, the device comprising:

a statistical dissimilarity computing part for computing a statistical  
 dissimilarity between the first and second images;

5 a perceptual dissimilarity computing part for computing a perceptual  
 dissimilarity between the first and second images; and

a texture feature dissimilarity computing part for computing a  
 dissimilarity between the texture features of the first and second images based  
 on the statistical dissimilarity and the perceptual dissimilarity.

10. The device of claim 9, wherein the perceptual dissimilarity  
 computing part quantitatively computes the perceptual attributes of texture of  
 the first and second images.

11. The device of claim 9, wherein the perceptual dissimilarity  
 computing part comprises:

a texture regularity measurer for quantitatively measuring regularity of texture as a perceptual attribute of the texture; and

- 5 a regularity-dissimilarity computing part for computing a dissimilarity between texture patterns in terms of regularity.

12. The device of claim 11, wherein the texture regularity measurer obtains quantitative measurements  $P^{(i)}$  and  $P^{(j)}$  of textures patterns of the first and second images  $i$  and  $j$  in terms of regularity, and the regularity-dissimilarity computing part obtains a dissimilarity between the texture
- 5 features by computing a dissimilarity  $\hat{d}(|P^{(i)} - P^{(j)}|)$  of the texture patterns of the first and second images  $i$  and  $j$  in terms of regularity when  $\hat{d}$  is assumed to be a predetermined function whose value is determined according to the range of a magnitude of a perceptual dissimilarity.

13. The device of claim 9, wherein the texture feature dissimilarity computing part computes a dissimilarity  $D(i, j)$  of the texture features of the first and second images  $i$  and  $j$  in accordance with
- $D(i, j) = d(i, j) + d(i, j)^{\alpha \hat{d}(P^{(i)}, P^{(j)})}$  using statistical dissimilarity data and
- 5 regularity-dissimilarity data, when it is assumed that  $\alpha$  is a predetermined scaling factor, and  $\hat{d}$  is a function defined as

$$\hat{d}(P^{(i)}, P^{(j)}) = \begin{cases} 0 & |P^{(i)} - P^{(j)}| \leq 1 \\ |P^{(i)} - P^{(j)}| & |P^{(i)} - P^{(j)}| > 1 \end{cases}$$